FIG. 1

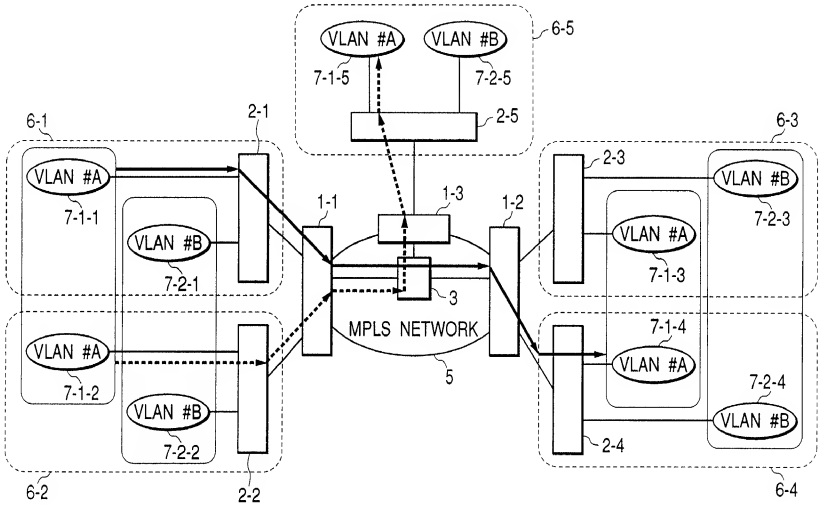
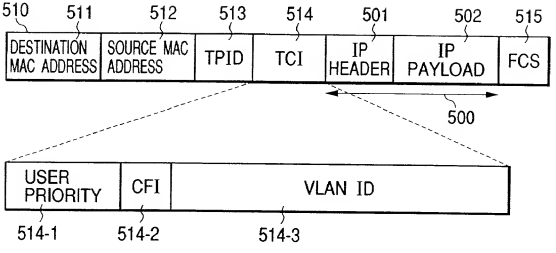

VLAN #A
VLAN #B
6-5
7-1-5
7-2-5
2-5
6-1
2-1
6-3
2-3
VLAN #A
7-1-1
VLAN #B
7-2-1
1-1
1-3
1-2
VLAN #B
7-2-3
VLAN #A
7-1-3
3
MPLS NETWORK
5
VLAN #A
7-1-2
VLAN #B
7-2-2
7-1-4
VLAN #A
7-2-4
VLAN #B
2-4
6-2
2-2
6-4

FIG. 2



TCI : TAG CONTROL INFORMATION
CFI : CANONICAL FORMAT INDICATOR
TPID : TAG PROTOCOL IDENTIFIER

FIG. 3

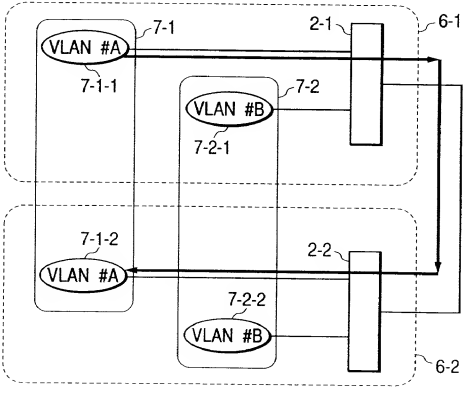


FIG. 4

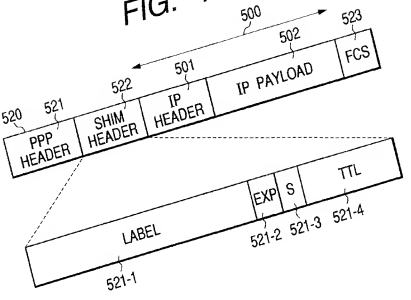

500
523
502
501
522
520
521
PPP HEADER
SHIM HEADER
IP HEADER
IP PAYLOAD
FCS
LABEL
EXP
S
TTL
521-1
521-2
521-3
521-4

FIG. 5

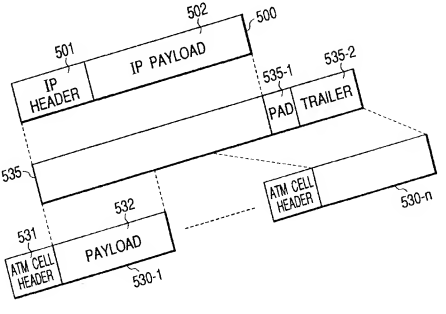

502
500
501
IP HEADER
IP PAYLOAD
535-1
535-2
PAD
TRAILER
535
ATM CELL HEADER
530-n
532
531
ATM CELL HEADER
PAYLOAD
530-1

FIG. 6

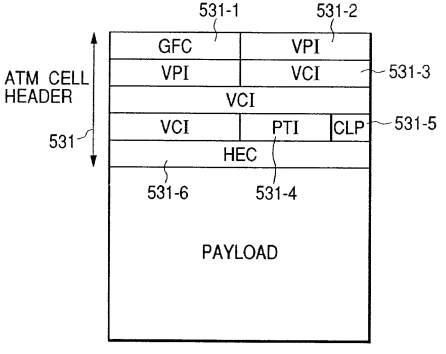

531-1
531-2
GFC
VPI
ATM CELL HEADER
VPI
VCI
531-3
VCI
VCI
PTI
CLP
531-5
531
HEC
531-6
531-4
PAYLOAD

FIG. 7

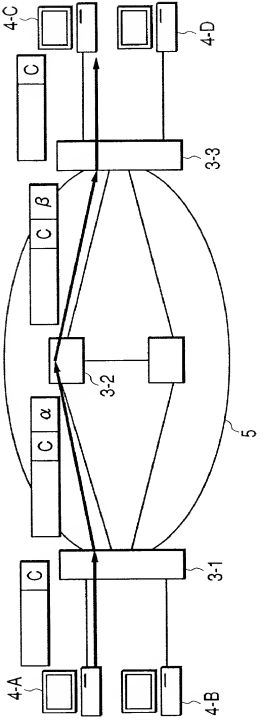


FIG. 8

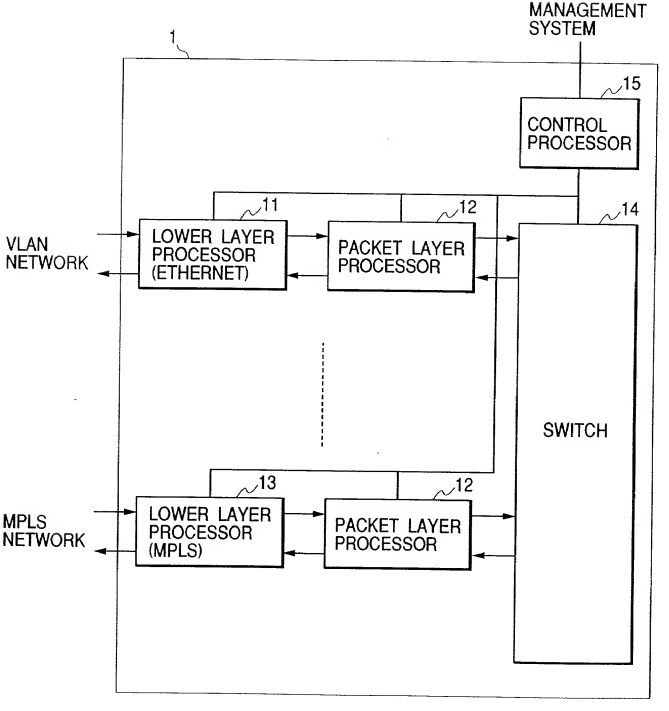

MANAGEMENT SYSTEM
1
15
CONTROL PROCESSOR
11
12
14
VLAN NETWORK
LOWER LAYER PROCESSOR (ETHERNET)
PACKET LAYER PROCESSOR
SWITCH
13
12
MPLS NETWORK
LOWER LAYER PROCESSOR (MPLS)
PACKET LAYER PROCESSOR

FIG. 9

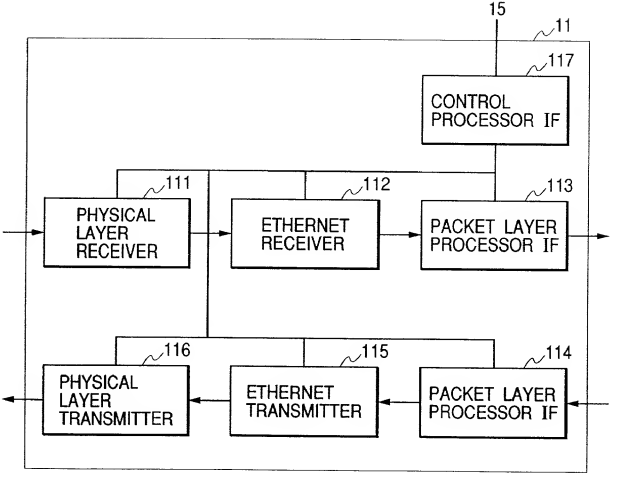

15
11
117
CONTROL PROCESSOR IF
111
112
113
PHYSICAL LAYER RECEIVER
ETHERNET RECEIVER
PACKET LAYER PROCESSOR IF
116
115
114
PHYSICAL LAYER TRANSMITTER
ETHERNET TRANSMITTER
PACKET LAYER PROCESSOR IF

FIG. 10

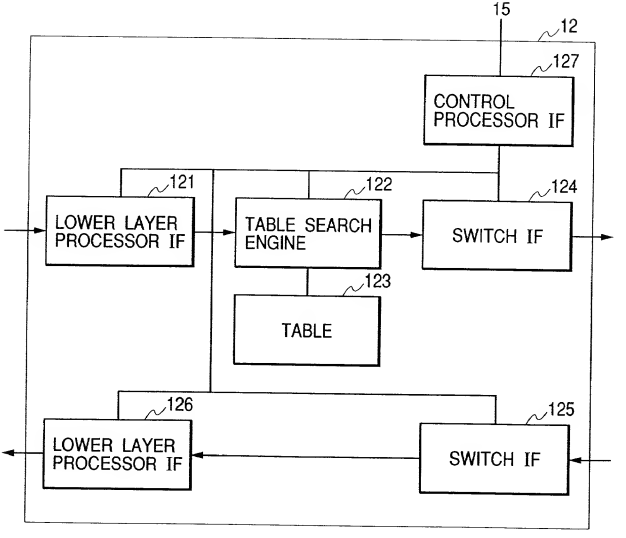

15
12
127
CONTROL PROCESSOR IF
121
LOWER LAYER PROCESSOR IF
122
TABLE SEARCH ENGINE
124
SWITCH IF
123
TABLE
126
LOWER LAYER PROCESSOR IF
125
SWITCH IF

FIG. 11

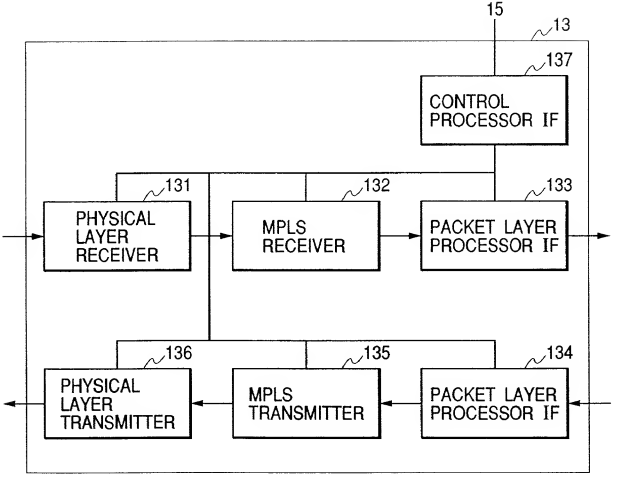

15
13
137
CONTROL PROCESSOR IF
131
PHYSICAL LAYER RECEIVER
132
MPLS RECEIVER
133
PACKET LAYER PROCESSOR IF
136
PHYSICAL LAYER TRANSMITTER
135
MPLS TRANSMITTER
134
PACKET LAYER PROCESSOR IF

FIG. 12

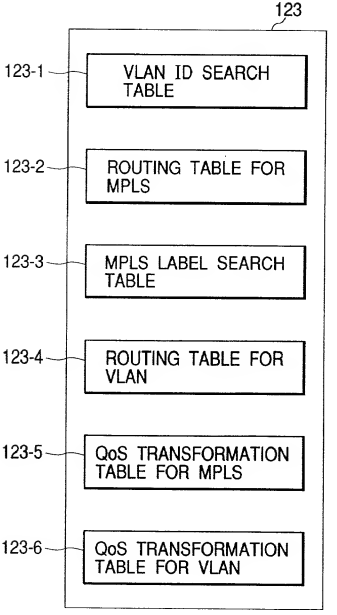

123
123-1
VLAN ID SEARCH TABLE
123-2
ROUTING TABLE FOR MPLS
123-3
MPLS LABEL SEARCH TABLE
123-4
ROUTING TABLE FOR VLAN
123-5
QoS TRANSFORMATION TABLE FOR MPLS
123-6
QoS TRANSFORMATION TABLE FOR VLAN

FIG. 13

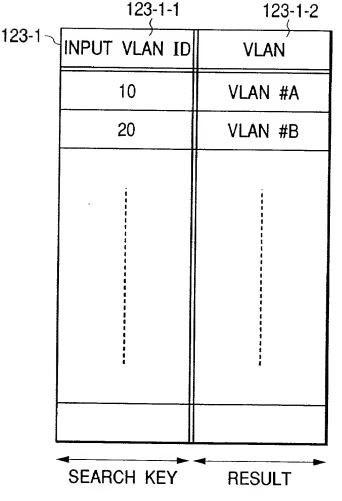

123-1-1
123-1-2
123-1
INPUT VLAN ID
VLAN
10
VLAN #A
20
VLAN #B
SEARCH KEY
RESULT

FIG. 14

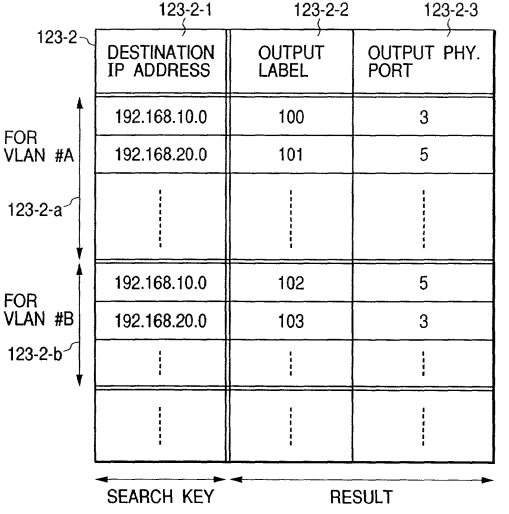

123-2-1
123-2-2
123-2-3
123-2
DESTINATION IP ADDRESS
OUTPUT LABEL
OUTPUT PHY. PORT
192.168.10.0
100
3
FOR VLAN #A
192.168.20.0
101
5
123-2-a
192.168.10.0
102
5
FOR VLAN #B
192.168.20.0
103
3
123-2-b
SEARCH KEY
RESULT

FIG. 15

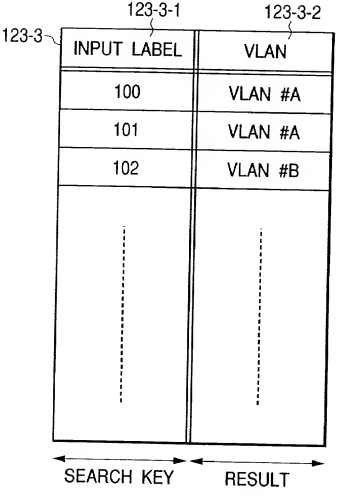

123-3-1
123-3-2
123-3
INPUT LABEL
VLAN
100
VLAN #A
101
VLAN #A
102
VLAN #B
SEARCH KEY
RESULT

FIG. 16

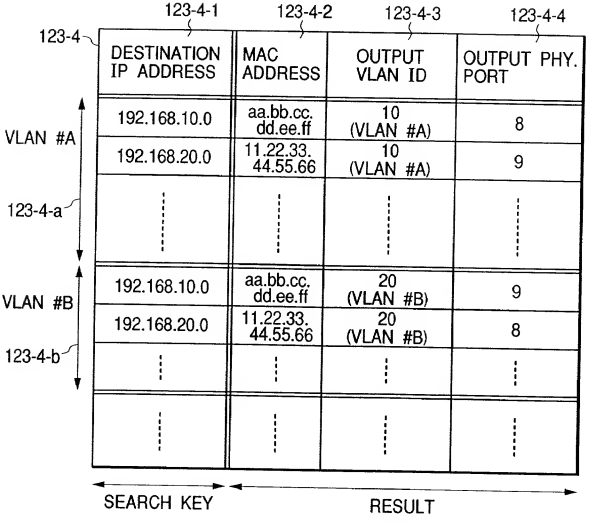

123-4-1
123-4-2
123-4-3
123-4-4
123-4
DESTINATION IP ADDRESS
MAC ADDRESS
OUTPUT VLAN ID
OUTPUT PHY. PORT
VLAN #A
192.168.10.0
aa.bb.cc. dd.ee.ff
10 (VLAN #A)
8
192.168.20.0
11.22.33. 44.55.66
10 (VLAN #A)
9
123-4-a
VLAN #B
192.168.10.0
aa.bb.cc. dd.ee.ff
20 (VLAN #B)
9
192.168.20.0
11.22.33. 44.55.66
20 (VLAN #B)
8
123-4-b
SEARCH KEY
RESULT

FIG. 17

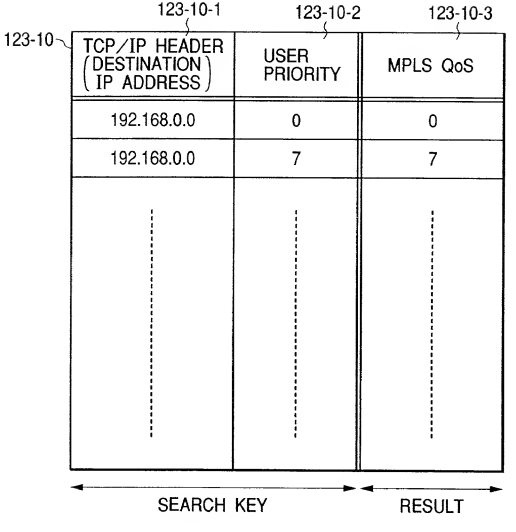

123-10-1
123-10-2
123-10-3
123-10
TCP/IP HEADER (DESTINATION IP ADDRESS)
USER PRIORITY
MPLS QoS
192.168.0.0
0
0
192.168.0.0
7
7
SEARCH KEY
RESULT

FIG. 18

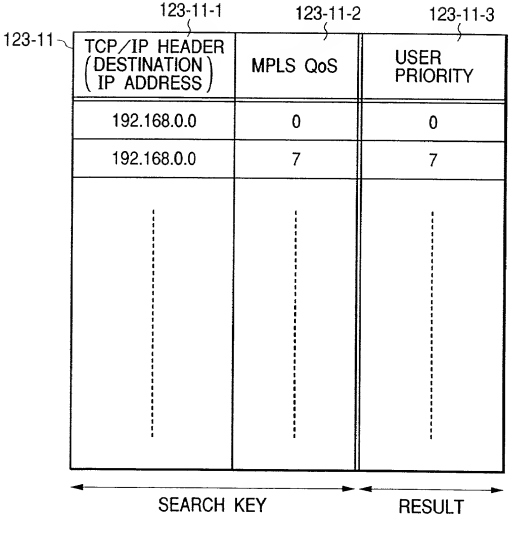

123-11
123-11-1
123-11-2
123-11-3
TCP/IP HEADER (DESTINATION IP ADDRESS)
MPLS QoS
USER PRIORITY
192.168.0.0
0
0
192.168.0.0
7
7
SEARCH KEY
RESULT

FIG. 19

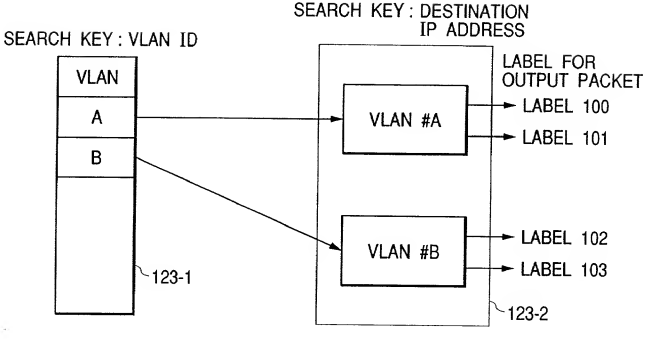
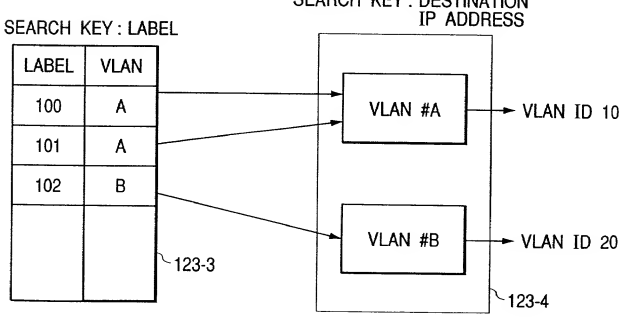

SEARCH KEY : VLAN ID
VLAN
A
B
123-1
SEARCH KEY : DESTINATION IP ADDRESS
VLAN #A
VLAN #B
123-2
LABEL FOR OUTPUT PACKET
LABEL 100
LABEL 101
LABEL 102
LABEL 103

FIG. 20


SEARCH KEY : LABEL
LABEL
VLAN
100
A
101
A
102
B
123-3
SEARCH KEY : DESTINATION IP ADDRESS
VLAN #A
VLAN #B
123-4
VLAN ID 10
VLAN ID 20